

Claims

- [c1] 1. An apparatus for reducing backlash in a gear wheel (10) comprising:
at least two interacting gear rims (11, 12) that rotate in relation to one another;
at least one adjusting means (15) located between the gear rims for adjusting the relative angle of rotation of the gear rims about a common axis of rotation, each of said adjusting means (15) comprising an hydraulic cylinder connected to a pressure medium source and being arranged to act between the two gear rims (11, 12) in such a manner that a force arises that tends to displace one gear rim in relation to the other about the axis of rotation;
each of the hydraulic cylinders (15) extending at an angle to a disk plane and supported on a part-spherical foot portion (15a) in a bowl-shaped seat (11a) in one gear rim (11) and a corresponding part-spherical head portion (15b) in a bowl-shaped seat (12a) in the other gear rim (12).
- [c2] 2. The apparatus as recited in claim 1, wherein at least two hydraulic cylinders (15) are located with even spac-

ing in relation to one another in a dividing plane between two gear rims (11, 12).

- [c3] 3. The apparatus as recited in claim 2, wherein each hydraulic cylinder (15) comprises two sleeve parts (15c, 15d) arranged telescopically, one inside the other, and one of which has a duct (18) connected to the interior of the sleeves for supplying pressure medium.
- [c4] 4. The apparatus as recited in claim 3, wherein the sleeve parts (15c, 15d) together form an inner chamber (17) that accommodates a compression spring (19), a guide bushing (20) for the spring and a spherical body (21) that together form a check valve for hydraulic pressure.
- [c5] 5. The apparatus as recited in claim 1, wherein the hydraulic cylinder (15) obtains working pressure from an oil pump of an internal combustion engine.
- [c6] 6. An apparatus for reducing backlash in a gear wheel, said apparatus comprising:
 - at least two interconnected gear rims relatively rotatable, one to the other, about a common axis of rotation;
 - a biasing mechanism interconnected between two of said gear rims, the biasing mechanism being operable to reduce backlash in the gear wheel; and

the biasing mechanism having a longitudinal axis oriented transversely to the gear rims.

[c7] 7. The apparatus as recited in claim 6, wherein the biasing mechanism comprises an elongate extendable and retractable device.

[c8] 8. The apparatus as recited in claim 6, wherein the biasing mechanism comprises an extendable and retractable hydraulic cylinder.

[c9] 9. The apparatus as recited in claim 6, wherein the biasing mechanism is pivotally interconnected to at least one gear rim by a ball-in-socket arrangement.

[c10] 10. The apparatus as recited in claim 9, wherein the ball-in-socket arrangement further comprises a part-spherical foot portion receivably supported in a bowl-shaped seat formed as recess in one of the gear rims.

[c11] 11 The apparatus as recited in claim 10 wherein the ball-in-socket arrangement further comprises a part-spherical head receivably supported in a bowl-shaped seat formed as recess in one of the gear rims.

[c12] 12 The apparatus as recited in claim 9, wherein the ball-in-socket arrangement further comprises a part-spherical head receivably supported in a bowl-shaped

seat formed as recess in one of the gear rims.

[c13] 13. The apparatus as recited in claim 8, wherein the extendable and retractable hydraulic cylinder further comprises two telescopically arranged sleeve parts defining an interior chamber fluidly connected to a pressure supply source.

[c14] 14. The apparatus as recited in claim 13, wherein the pressure supply source is an oil pump of an internal combustion engine.

[c15] 15. The apparatus as recited in claim 13, further comprising:
a compression spring, a guide bushing for the compression spring and a spherical body are housed in the interior chamber and together form a check valve for controlling hydraulic pressure.

[c16] 16. An apparatus for reducing backlash in a gear wheel, said apparatus comprising:
at least two interconnected gear rims relatively rotatable, one to the other, about a common axis of rotation;
at least two biasing mechanisms, each interconnected between two of said gear rims and radially spaced equidistantly about the common axis of rotation, the biasing mechanisms being operable to reduce backlash in

the gear wheel; and
the biasing mechanisms each having a longitudinal axis oriented transversely to the gear rims.

[c17] 17. The apparatus as recited in claim 16, wherein the at least two biasing mechanisms further comprise at least four biasing mechanisms radially spaced equidistantly about the common axis of rotation.

[c18] 18. The apparatus as recited in claim 16, wherein each biasing mechanism is pivotally interconnected to at least one gear rim by a ball-in-socket arrangement.

[c19] 19. The apparatus as recited in claim 18, wherein each biasing mechanism further comprises a part-spherical foot portion receivably supported in a bowl-shaped seat formed as recess in one of the gear rims.

[c20] 20. The apparatus as recited in claim 18 wherein each biasing mechanism further comprises a part-spherical head receivably supported in a bowl-shaped seat formed as recess in one of the gear rims.